CLAIMS

1. Use of at least one silane of formula

(I) R_mSiX_{4-m},

wherein m denotes an integer from 0 to 4, R is a nonhydrolyzable organic group and X denotes a hydrolyzable group, in a cosmetic agent for improving the condition of hair.

2. Use according to claim 1, characterized in that the silane has the formula

(II) R_nSiX_{4-n},

wherein n is an integer from 0 to 3, R is a nonhydrolyzable organic group and X denotes a hydrolyzable group.

3. Use according to claim 2, characterized in that the silane has the formula

(III) R_oSiX_{4-o},

wherein o is an integer from 0 to 3, each R group independently of each other denotes a substituted or unsubstituted alkyl group each with 1 to 16 carbon atoms or a substituted or unsubstituted hydroxyalkyl group each with 1 to 16 carbon atoms and 1 to 6 hydroxyl groups or a substituted or unsubstituted phenyl, and each X independently of each other denotes a hydroxyl, halogen, acetyl, acetoxy, acyl, acyloxy or alkoxy group with 1 to 6 carbon atoms, a hydroxylated polymer unit, a polyglycol or a polyalkyl ether with 4 to 18 carbon atoms.

4. Use according to one of claims 1 to 3, characterized in that in the silanes of formula (I), (II) or (III) m, n or o is the integer 1 or 2.

5. Use according to one of claims 1 to 4, characterized in that the silane is selected from among the compounds of formulas

(IV) $(R_1)_3SiR_2N^+(R_3)(R_4)(R_5)Y^-$

(V) $(R_1)_3SiR_2N(R_3)(R_4)$

(VI) $(R_1)_3SiR_2R_7$

(VII) $(R_1)_2SiR_8R_9$,

in each of which

R_1 is independently halogen or R_6O, wherein R_6 is selected from among H; alkyl; aryl, acetyl; acetoxy; acyl; acyloxy; glycol; polyglycol; alkylglycol, alkyl polyglycol; a monoester formed by linking a carboxylic acid with 1 to 24 carbon atoms with a glycol or polyglycol; alkylphenol, substituted with an alkyl having 1 to 24 carbon atoms, an ether thereof or a sorbitan ester thereof;
R_7 denotes R_6, H, halogen, halogenated or perhalogenated alkyl or aryl, $NH_2(CH_2)_2NHR_2$, NH_2R_2, $C_3H_5O_2R_2$, $C_4H_6O_2R_2$, $NaO(CH_3O)P(O)R_2$, or $ClCH_2C_6H_4R_2$,
R_8 and R_9 independently of each other denote R_7, alkyl with 1 to 24 carbon atoms, isobutyl, phenyl or n-octyl;
R_2 denotes R_6, benzyl or vinyl;
R_3 and R_4 independently of each other denote R_7, hydroxyalkyl, alkoxy or alkyl with 1 to 6 carbon atoms,
R_5 denotes hydroxyalkyl, $R_7CH_2C_6H_5$, polyglycol, alkyl, alkoxy, perfluoroalkyl, perfluoroalkyl sulfonate or perfluoroalkyl carboxylate, or R_3 and R_4 together represent morpholine or some other cyclic or heterocyclic molecule and
Y^- is a common anion for forming the salt of the compounds of formulas IV, V, VI or VII.

6. Use according to one of claims 1 to 3, characterized in that the silane is selected from among the compounds
3-(trimethoxysilyl)propyldimethyloctadecylammonium chloride, 3-(trimethoxysilyl)propyl-meththyldi(decyl)ammonium chloride, 3-chloropropyltrimethylsilane, 3-chloropropyltrimeth-oxysilane, octadecyltrimethoxysilane, 1H,1H,2H,2H-perfluorooctyltriethoxysilane and 1H,1H,2H,2H-perfluorodecyltriethoxysilane.

7. Use according to one of claims 1 to 3, characterized in that the silane is selected from among the compounds
$NH_2(CH_2)_2NH(CH_2)_3Si(OCH_3)_3$, $NH_2(CH_2)_3Si(OCH_3)_3$,
$NH_2(CH_2)_3Si(OCH_2CH_3)_3$, $Cl(CH_2)_3Si(OCH_3)_3$, $Cl(CH_2)_3Si(OCH_2CH_3)_3$, $Cl(CH_2)_3SiCl_3$, $C_3H_5O_2(CH_2)_3Si(OCH_2CH_3)_3$, $C_3H_5O_2(CH_2)_3Si(OCH_2CH_3)_3$, $C_4H_5O_2(CH_2)_3Si(OCH_3)_3$, $C_4H_5O_2(CH_2)_3Si(OCH_2CH_3)_3$, CH_3SiHCl_2, $NaO(CH_3O)P(O)(CH_2)_3Si(OH)_3$, $SiHCl_3$,
N-2-vinylbenzylaminoethyl-3-aminopropyltrimethoxysilane.HCl, $H_2C=CHSi(OCOCH_3)_3$, $H_2C=CHSi(OCH_3)_3$, $H_2C=CHSi(OCH_2CH_3)_3$, $H_2C=CHSiCl_3$, $(CH_3)_2SiCl_2$, $(CH_3)_2Si(OCH_3)_2$, $(C_6H_5)_2SiCl_2$, $(C_2H_5)SiCl_3$, $(C_2H_5)Si(OCH_3)_3$, $(C_2H_5)Si(OCH_2CH_3)_3$, isobutyltrimethoxysilane, n-octyltriethoxysilane, $CH_3(C_6H_5)SiCl_2$, CH_3SiCl_3, $CH_3Si(OCH_3)_3$, $C_6H_5SiCl_3$, $C_6H_5Si(OCH_3)_3$, $C_3H_7SiCl_3$, $C_3H_7Si(OCH_3)_3$, $SiCl_4$, $ClCH_2C_6H_4CH_2CH_2SiCl_3$,

$ClCH_2C_6H_4CH_2CH_2Si(OCH_3)_3$, $ClCH_2C_6H_4CH_2CH_2Si(OCH_2CH_3)_3$, decyltrichlorosilane, dichloromethyl(4-methylphenethyl)silane, diethoxymethylphenylsilane, trimethoxysilane, 3-(dimethoxymethylsilyl)-1-propanethiol, dimethoxymethylvinylsilane, 3-propyl methacrylate, trichlorosilane, methylbis(trimethylsilyloxy)vinylsilane, methyltripropoxysilane and trichlorocyclopentylsilane.

8. Use according to one of claims 1 to 5, characterized in that the silane of formula (I) is selected from among the compounds of formula

VIII $(R_a)_3SiR_b$

wherein R_a is independently halogen or $R_{10}O$, wherein R_{10} is selected from the groups alkyl with 1 to 6 carbon atoms, acetyl, acetoxy, acyl, acyloxy; glycol; polyglycol; alkylglycol with 1 to 10 carbon atoms and alkylpolyglycol with 1 to 10 carbon atoms, and R_b denotes alkyl with 1 to 16 carbon atoms, halogenated alkyl with 1 to 16 carbon atoms or perhalogenated alkyl of formula C_pZ_{2p+1} with Z = F, Cl or Br, and p = 1 to 16.

9. Use according to one of claim 1 to 8, characterized in that the silane of formula (I) is selected from among substituted silanes of formula

(IX) $(R_cO)_3SiR_d$

wherein R_c denotes a straight-chain or branched alkyl group with 1 to 5 carbon atoms and R_d denotes a straight-chain or branched fluorinated or perfluorinated alkyl group with 1 to 8 carbon atoms and preferably 8 to 10 carbon atoms.

10. Use according to claim 9, characterized in that the silane of formula (IX) is selected from among 1H,1H,2H,2H-perflorooctyltriethoxysilane and 1H,1H,2H,2H-perflorodecyltriethoxysilane

11. Use according to one of claims 1 to 8, characterized in that the improvement in the condition of the hair consists of hardening, strengthening, sealing (particularly after hair dyeing or tinting), restructuring, repair, stabilization, enhancement of luster, volume and combability, protection from environmental influences, protection from heat (during drying with a hair drier and hair smoothing with a hot iron), preventing and reducing hair splitting, shortening the hair-drying time and increasing the tensile strength and elasticity of the hair

as well as the permanence of permanent waves.

12. Use according to one of claims 1 to 9, characterized in that the silane of formula (I) is linked to a UV filter, said UV filter being selected from among para-aminobenzoic acid, aminobenzoic acid, salicylic acid, cinnamic acid, benzoic acid, benzophenone and the alkyl derivatives or anhydrides or mixed anhydrides thereof, the linking being the result of the elimination of one atom or one group from the said UV filters and the attachment of the said silane at the free valence.

13. Use according to one of claims 1 to 11 on weakened and/or damaged hair.

14. Use according to one of claims 1 to 13, characterized in that the agent is brought in contact with the hair after the hair had been subjected to a chemical treatment.

15. Use according to claim 14, characterized in that the chemical treatment comprises dyeing, tinting, bleaching or permanent deformation.

16. Use according to one of claims 1 to 10 in a permanent wave pretreatment agent.

17. Use according to claim 14 or 16 for cosmetic treatment of sensitive, brittle and/or fine hair.

18. Use according to one of claims 1 to 17, characterized in that the silane or a salt thereof is contained in the agent in an amount from 0.01 to 10 weight percent, based on the total amount.

19. Use according to one of claims 1 to 18, characterized in that the silane or a salt thereof is contained in the agent in an amount from 0.1 to 5 weight percent, based on the total amount.

20. Use according to one of claims 1 to 19, characterized in that the agent is brought in contact with the hair for a period of 10 seconds to 60 minutes at a temperature between 20 °C and 60 °C.

21. Method for dyeing and simultaneously improving the condition of human hair, characterized in that
(a) the hair is brought in contact with a direct hair colorant or an oxidative hair colorant for 5 to 40 minutes,
(b) the hair colorant is optionally rinsed out with water and the hair is optionally dried,
(c) the hair is then brought in contact with a silane-containing agent in accordance with one of the preceding use claims 1 to 18, and
(d) the hair is optionally rinsed with water and optionally dried.

22. Method for dyeing and simultaneously improving the condition of human hair, characterized in that the hair is brought in contact for 1 to 40 minutes with a direct hair colorant or an oxidative hair colorant containing from 0.01 to 10 wt.% of a silane of formula (I), and the hair is then washed or rinsed and dried.

23. Agent for oxidative dyeing of human hair, containing at least one oxidative hair dye, characterized in that said agent contains from 0.01 to 10 wt.% of least one silane of formula (I) or of a salt thereof.